## REMARKS

Claims 1-15 are pending with claims 4-6 withdrawn and 7-15 added.

Election/Restriction

Applicants affirm the election with traverse of claims 1-3 of Group I. Applicants respectfully submit that it has not been established that examining all the claims would constitute a serious burden.

Claim Rejections Under 35 U.S.C §112, Second Paragraph

Applicants have amended claim 1 to clarify that this claim is not a Jepson claim. With respect to claim 3, Applicants have amended claim 3 to clarify that the "synthetic quartz glass" is a --fluorine-containing synthetic quartz glass--. This amendment clarifies that the fluorine-containing synthetic quartz glass, not the porous silica matrix, is heat treated in a hydrogen gas-containing atmosphere. This interpretation is also consistent with the specification. Consequently, Applicants respectfully submit that these rejections should be withdrawn. In addition, Applicants respectfully submit that the amendments made to overcome the 35 U.S.C §112, second paragraph rejections, do not narrow the scope of the claims. All the amendments made in claims 1 and 3 are made for this purpose, except for defining the angle as being from 90° - 110°, as discussed further below.

Claims Rejections Under 35 U.S.C §103

Claims 1-3 stand rejected as allegedly being unpatentable over U.S. Patent No. 5,326,729 (Yaba) in view of JP 04-074728 (Ito). Applicants respectfully traverse these rejections.

Yaba discloses a process for producing quartz glass having an OH content of not more than 10 ppm, a halogen content of at least 400 ppm and containing hydrogen, which comprises:

(1) a step of having fine particles of quartz glass obtained by flame-hydrolysis of a glass-forming raw material deposited and grown on a substrate to obtain a porous quartz glass product,

(2) a step of maintaining the porous quartz glass product in a temperature range of not higher than the transparent vitrification temperature to dehydrate the porous quartz glass product,

(3) a step of heating the dehydrated porous quartz glass product to the transparent vitrification temperature to conduct transparent vitrification to obtain a transparent quartz glass product,

(4) a step of heating the transparent quartz glass product to a temperature of not lower than the softening point to mold it into a desired shape to obtain a molded quartz glass product, and

(5) a step of subjecting the molded quartz glass product to a heat treatment in a hydrogen-containing atmosphere. See column 2, lines 31 - 63.

In step (2), the porous quartz product is maintained in a halogen atmosphere such as a fluorine source. See column 4, lines 47-63.

Ito discloses a process for producing light-wave guides that includes a rotary table 23 held with a seed rod 21 in a reaction vessel 22 and a substrate 24 fixed under the table 23. An oxyhydrogen burner 26 is placed under the substrate 24 in such a manner as to form a flame at an angle of 0-85° to the vertical direction. A glass material is put into the oxyhydrogen flame 27 blasting slantly upward from the burner 26 and the synthesized glass soot is deposited on the lower face 24a of the substrate 24 to form a glass soot film 25. See abstract and drawings.

However, Yaba fails to disclose and much less teach that the silica matrix and the flame reactant gas from the burner are oriented to define an angle of 90° - 110° between their respective center axes so that the porous silica matrix has a density of 0.1 to 1.0 g/cm$^3$ with its distribution within 0.1 g/cm$^3$, thereby vitrifying the matrix into a quartz glass having a uniform fluorine concentration.

Moreover, there is insufficient motivation to combine Yaba and Ito to render the claimed invention *prima facie* obvious. Ito only discloses the production of quartz light waveguide by coating a substrate, typically a metal, with glass soot. Ito fails to disclose an optical fiber.

Furthermore, Ito fails to disclose the inventive process for producing a synthetic quartz glass. Particularly, Ito fails to teach or suggest that if the doping rate of fluorine varies with the matrix density, the concentration of fluorine atoms doped is partially graded in a matrix having a

density distribution. In addition, Ito fails to teach or suggest that if a matrix having a uniform density is obtained by controlling the angle of a burner (if the silica matrix and the flame of reactant gas from the burner are oriented to define an angle of 90° to 110° between their respective center axes), that the matrix can be vitrified into a quartz glass having a uniform fluorine concentration upon heating and vitrifying the porous silica matrix.

Consequently, there is insufficient motivation to combine Yaba and Ito to render the claimed invention unpatentable.

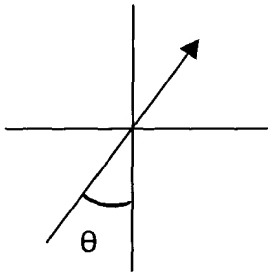
Claims 1-3 stand rejected as allegedly being unpatentable over Yaba in view of U.S. Patent No. 4,367,085 (Suto). Applicants respectfully traverse these rejections.

Yaba has been discussed above.

Suto discloses a method of fabricating an optical fiber preform wherein a synthesizing torch is inclined between 10° and 60° with respect to the rotation axis of the seed rod.

Please note the angle θ is as follows:

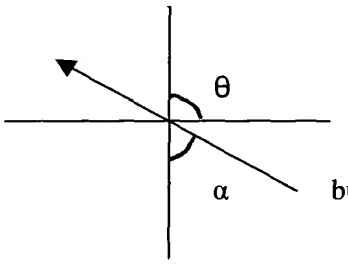
FIG. A




θ = 10° to 60°

On the other hand, the angle of the present invention is as follows:

FIG. B




burner 2

θ = 90° to 110°

α = 180° — θ

= 90° to 70°

Accordingly, the angle α (=180° - θ) in Fig. B (the invention) corresponds to the angle θ in FIG. A (Suto).

Therefore, Suto fails to cure the deficiencies of Yuba because Suto fails to teach that the silica matrix and the flame of reactant gas from the burner are oriented to define an angle of 90° to 110° between their respective center axes.

In view of the above remarks, favorable reconsideration is courteously requested. If there are any remaining issues which can be expedited by a telephone conference, the Examiner is courteously invited to telephone Counsel at the number indicated below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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